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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,447	09/08/2003	Timothy Crowley	9138-0098US	4731
32425 7590 12/06/2007 FULBRIGHT & JAWORSKI L.L.P. 600 CONGRESS AVE. SUITE 2400 AUSTIN, TX 78701				
EXAMINER MENON, KRISHNAN S				
ART UNIT 1797		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/658,447

Applicant(s)

CROWLEY ET AL.

Examiner

Krishnan S. Menon

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-110 is/are pending in the application.
- 4a) Of the above claim(s) 1-6, 13-64 and 69-71 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7-12, 65-68 and 72-110 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

Claims 1 and 3-110 are pending after the amendment of 10/31/07, of which claims 1-6,13-64, 69-71 are withdrawn from consideration, as of the RCE of 10/31/07.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 7-10, 65-68,72-83, 85,87-92,97-105 and 107-110 are rejected under 35 U.S.C. 102(b) as being anticipated by Sundberg et al (US 6,090,251).

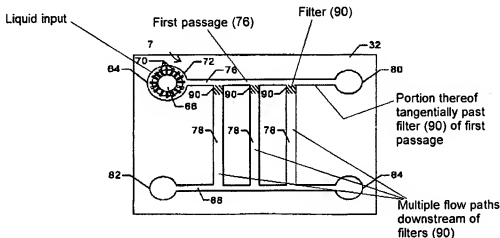


Fig. 7

Fig 7 annotated with respect to claim 7.

Figure 7 of the reference is annotated with the elements of claim 7 to show how the claims read on the reference.

Sundberg teaches a microfluidic instrument in figure 7 comprising an input (70), a first passage (76), a tangential filter in the first passage (the first of the filter 90, which is a weir type filter – see figure 8), and multiple liquid flow paths (78) downstream of the filter as claimed – for claim 7, the second and third flow paths (78) are downstream and is tangentially past the first filter (90). For claim 81, all channels 78 are downstream, because claim 81 does not recite “tangential” structure. Figure 7 shows only three channels 78, but the abstract and column 4 lines 3-10 teaches that any number of channels 78 are possible (such as five or more). All flow paths are parallel, lead to an output (82,84), have analytical provisions (column 1 lines 10-15, column 5 lines 15-28), and have capillary action (abstract). Tangential flow as in claim 85 over filter 90.

Claims 65-68, 98 recite the means plus function language for continuous flow, which is capillary action as disclosed in the specification (35 USC 112, sixth paragraph, means plus function language would be the corresponding disclosure or equivalents thereof). Sundberg teaches the structure recited in the claims as above. With respect to claim 66, the plurality of parallel channels are defined to “draw the liquid filtrate therethrough”, which read on the channels 78 of the reference.

Claim 87, 104: smooth surface, semiconductor – see materials in column 6 lines 57-67.

Claim 88, 101: several instruments, part of a device – see abstracts: microfluidic substrates; column 1 lines 5-10 describe the invention as structure for introduction of fluids into devices.

Claim 92: covering plate – see figures 7 and 8: plan and cross-sectional elevation, showing covered structures.

Claim 97: weir type opening – see figure 8.

Claim 72-80, 82,83, 89,90, 99,100, 107-110: the recitations in these claims, 'the complex fluid', blood, cell lysis, the flow times, filtrate quantities, and other 'instrument requirements' are intended use, which are not patentable. The instrument taught by the reference is capable of all these. See also column 9 lines 50-67.

Claim 102, 105: multiple receiving means – see 70, figure 7.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11,12, 84,86,93-96 and 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sundberg as applied to claims 10 and 81 above, and further in view of Quake et al (US 2004/0248167).

The teaching of Sundberg differs from claims 11 and 12 in the recitation of the details of the electro-optical means. Quake teaches a laser-optic detection system

(figures, abstract, col 7 lines 50-59). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Quake in the teaching of Sundberg as one of the various intended uses of the Sundberg system for sample separation and analysis.

Claims 84,86,93-96 and 106 differ from the teaching of Sundberg in the recitation of certain dimensions of the channels. However, Sundberg teaches how to size the channels and optimize the instrument in column 9 line 50-column 10 line 38. Moreover, In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. Also, Sundberg teaches channel widths, etc., in column 6 lines 9-25 with respect to the generation of capillary action. Sundberg does not teach the length of the channels. Quake teaches the length of the channels as about 1  $\mu\text{m}$  to 2 cm, depending on the need for the analytical methods (see paragraph 187). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Quake in the teaching of Sundberg for analysis of the samples of Sundberg as taught by Quake.

3. Claims 81-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brody (US 5,922,210) in view of Quake et al (US 2004/0248167).

Brody teaches an instrument comprising an input (1-figures), filter (5), passages from input to filter (4) and filter to output (6) all of which are capillary flow paths (inherent), and liquids flow by capillary action (inherent). Material is silicon wafers (example). Channel dimensions, separated particle sizes and fluid volumes – see column 3 lines 50-67, column 5 lines 4-25 and col 6 lines 13-25. the fluid to be treated, such as blood, and residence times (15 seconds), are intended use.

Instant claims add the further limitation of plurality of fluid flow paths connected to the first passage to receive flow therefrom by capillary action and channel dimensions, which Brody does not teach. Quake teaches plurality of capillary flow paths (32) from a reservoir (48) (see - figure 1) which lead to an analyzer (50), and electro-optical means for testing (abstract); and channel dimensions such as length, width, etc in paragraph 153 and 187. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Quake in the teaching of Brody for the analysis of the filtered samples as taught by Brody for analysis such as DNA detection, etc as taught by Quake. One of ordinary skill in the art would also use the teaching of Brody to pre-filter the samples of Quake as taught by Brody for removing unwanted particulates.

4. Claims 7-10, 65-68, 72-83, 85, 87-92, 97-105 and 107-110 rejected under 35 U.S.C. 103(a) as being unpatentable over Brody et al (US 5,922,210) and/or Sundberg et al (US 6,090,251) in view of Hillman, et al (US 5,204,525).

Claim interpretation for this rejection: the independent claims 7, 65 and 81 are assumed to recite a liquid feed inlet, a first passage leading from the liquid feed inlet to

an expanded region having a plurality of capillaries which provide **capillary pumping action** to the feed fluid, and at least one weir filter located tangential to the first passage between the feed inlet and the expanded region, communicating between the first passage and a filtrate flow path (support: applicant's figure 1). [Highlighted portion has no explicit support in applicant's disclosure]

Sundberg teaches a first passage (76), tangential weir filters (90), filtrate flow paths (78), and expanded portion to first passage past the filters at (80), but not plurality of capillaries for pumping action at the expanded region. Sundberg teaches capillary action and electro-osmotic forces for moving fluids through the channels.

Brody teaches inlet (1), first passage (4), expanded region (2), weir filter tangential to first passage (5), filtrate path (6), but no plurality of capillaries at the expanded region (2). However Brody teaches that the pumping could be accomplished by any means such as surface tension forces.

Hillman teaches capillary action pump having at least one capillary that can be used for pumping fluids (column 2, lines 50-60). Such capillary action pumps are also well known in the art (a forward and back search on the Hillman reference will show this). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching such as of Hillman in the teaching of Brody or Sundberg for providing sufficient pumping forces for pumping the fluids through the filters, because Brody teaches that 'surface tension forces' can be used for such pumping. One would use the teaching of Hillman also because it affords constant flow rates without having to use additional means for flow control.



5. Claims 11,12, 84,86,93-96 and 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brody et al (US 5,922,210) and/or Sundberg et al (US 6,090,251) in view of Hillman, et al (US 5,204,525) and further in view of Quake, et al.

Claims differ from the teaching of Brody and/or Sundberg in the electro-optical means and the channel dimension. For details of this rejection, see the rejection paragraphs 2 and/or 3 above.

### ***Response to Arguments***

Applicant's arguments filed 10/31/07 have been fully considered but they are not persuasive. They are not commensurate in scope with the claims or the rejection. Independent claims 7, 65 and 81 are a bit confusing and read on the reference rather than on applicant's figure 1. An interpretation of the claims with respect to applicant's fig 1 is provided in the rejection paragraph 4.

### ***Allowable Subject Matter***

The following independent claim drafted by the examiner and considered to distinguish patentably over the art of record in this application, is presented to applicant for consideration:

(New) An instrument for observation, treatment or analysis of a drop-size sample of a liquid comprising:

a liquid input opening for receiving the sample,

a first passage leading from the liquid input opening to an expanded liquid flow region,

at least one weir filter located tangentially along each side of the first passage between the input opening and the expanded region,

a filtrate channel located on each side of the first passage parallel to the first passage,

each weir filter in communication with the first passage and the filtrate channel located on the same side of the first passage as the weir filter, and

the expanded region comprising a plurality of parallel capillary channels sized to sustain the draw of sample through the first passage tangentially past the weir filters by capillary action.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Art Unit 1797